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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,204	02/28/2002	Takako Suzuki	Q67844	6177

7590 05/18/2004

SUGHRUE MION, PLLC
2100 Pennsylvania Avenue, NW
Washington, DC 20037-3213

EXAMINER

CHU, JOHN S Y

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/084,204	SUZUKI ET AL	
	Examiner	Art Unit	
	John S. Chu	1752	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office action is in response to the reconsideration received February 11, 2004.

1. The rejection under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 6,379,859 is **withdrawn** in view of the approved Terminal Disclaimer submitted with the reconsideration of February 11, 2004.
2. The provisional rejection under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of copending Application No. 10/035,137 is **withdrawn** in view of the approved Terminal Disclaimer submitted with the reconsideration of February 11, 2004.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-4 and 6-20 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: the quinonediazide methyl gallate compound which is present in all the examples and is required to provide the improved resist pattern having a good shape.

The arguments by applicant's attorney has been carefully considered, however the rejection is maintained and repeated, because contrary to applicant's attorney's argument that the quinonediazide methyl gallate is not required, it is repeated that the novel properties displayed in the examples appear to require the presence of a quinonediazide methyl gallate in order to give

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the disclosed improvement recited by applicant as found on page 4 (for forming a resist pattern not more than half a micron having a good dimensional shape).

Because the quinonediazide is seen to be a required element based on the specification, applicants are urged to include the limitations in the claims to complete the claimed composition.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

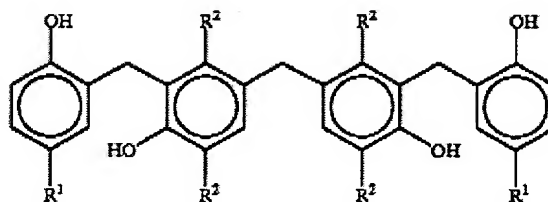
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 6-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over KAWATA et al in view of MOMOTA et al further in view of SATO et al, ANDO et al and UETANI et al '657.

The claimed invention is drawn to a positive photoresist composition comprising

(A) an alkali-soluble resin

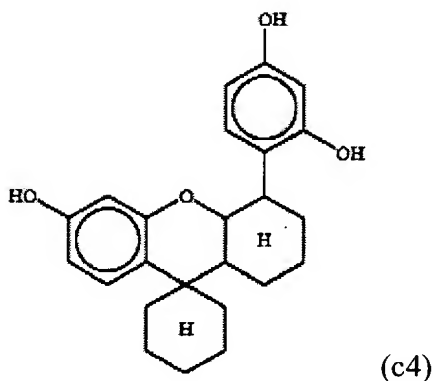
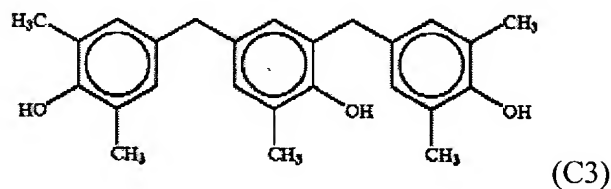
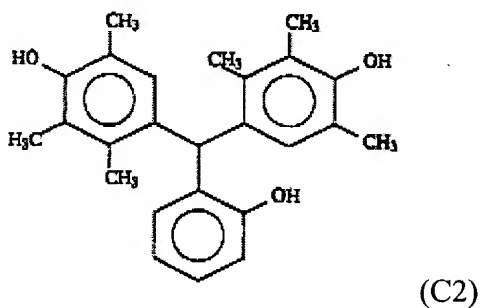
(B) a photosensitizer containing a quinonediazide ester of a compound of the following formula (I)



,and

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(C) at least one compound of phenol group-containing compounds having structural formula (C2), (C3) or (C4) and having an elution time in the range from 6 to 30 minutes in high performance liquid chromatography, said high performance liquid chromatography being conducted under the following conditions: eluent: a mixture solvent of water: tetrahydrofuran:methanol=40:24:36 (by weight): column 4.6mm(diameter x 150 mm (length) containing 5 μ m silica gel as a filler (carbon content being about 15 %); column temperature: 45.0 $^{\circ}$ C; and supply rate of eluent: 0.7.00 ml/min.



KAWATA ET AL discloses a positive photosensitive composition comprising an alkali-soluble resin, a quinonediazide ester and a polyphenol additive. Applicants are directed to

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column 7 and 8, compound (b-7) which meets the claimed compound of formula (I) lacking only a methyl or ethyl group in the two central aromatic groups. KAWATA ET AL teaches a hydrogen substituted in the two central aromatic groups. As for claimed ingredient (c) in the application, KAWATA ET AL discloses a phenol compound found in column 24, line 35 defined as (C-49) which would meet the elution properties recited if processed in that manner. Further compound (C-64) in column 36, line 45 - 60 also meets the claimed elution properties.

MOMOTA ET AL teaches a photoresist composition comprising an alkali-soluble resin, a quinonediazide compound and a polyphenol additive. MOMOTA ET AL is cited to disclose that the use of alkyl groups or hydrogen groups in quinonediazide esters of polyphenol compounds is interchangeable and the skilled artisan would reasonably expect same or similar results, see the compounds of (I-1) and (I-3) found in columns 3/4, lines 60-68 and columns 5/6, lines 10-15, respectively. The compounds show a phenol compound to be esterified with quinonediazide to have hydrogens and methyl groups in the two central aromatic groups with relatively the same results with respect to resolution, sensitivity and film thickness loss, see Table 1 and 2, examples 5 and 7 in column 23, lines 1-68.

It would have been *prima facie* obvious to one of ordinary skill in the art of photoresist compositions to use an alkyl substituted polyphenol photosensitive compound disclosed in MOMOTA ET AL in the photoresist composition of KAWATA ET AL in place of the (B-7) as a photosensitive ingredient with the reasonable expectation of same or similar results as disclosed in KAWATA ET AL for excellent sensitivity, resolution and film thickness loss.

SATO et al discloses a positive photoresist composition comprising an alkali-soluble resin, a quinonediazide compound and a phenolic additive compound as seen in column 60,

compound (C8). These additive compounds provide photoresist composition increased dissolution rates.

ANDO et al discloses a positive photosensitive composition comprising an alkali-soluble resin, a quinonediazide compound and a phenol additive, see column 7, line 39 -47 These compounds meets the claimed compound found in claim 12 for (c3). The phenol additive provides for improved excellent cross sectional profile.

UETANI et al '657 discloses a positive photoresist composition comprising an alkali-soluble resin, a quinonediazide compound and a phenol compound additive, as seen in column 4, line 11-25. The additive phenolic compound provides for improved sensitivity, heat resistance and film thickness retention.

It would have been *prima facie* obvious to one of ordinary skill in the art of positive photoresist composition to use known phenolic additives as disclosed in SATO et al , ANDO et al and UETANI et al in place of the additive phenolic compounds in KAWATA et al and reasonably same or similar results in improved sensitivities, improved developing properties and excellent pattern profile formation.

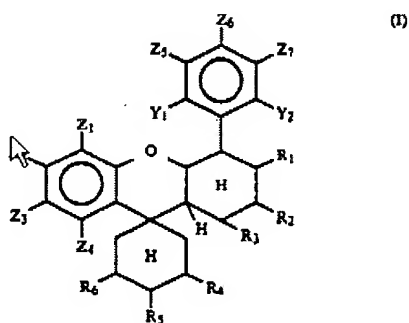
The arguments by applicant have been carefully considered in addition with respect to the comparative examples found in the specification. In the analysis by the examiner, it is noted that the comparative examples fail to be of proper scope, wherein a comparison to the closed prior art reference, used in the *prima facie* case of obviousness above, is missing. The Comparative Examples 2-4 demonstrate a composition missing a phenolic additive compound which lacks the disclosed improved resist pattern having a good dimensional shape, however the prior art composition to KAWATA et al disclose a photosensitizer differing only by the recited alkyl

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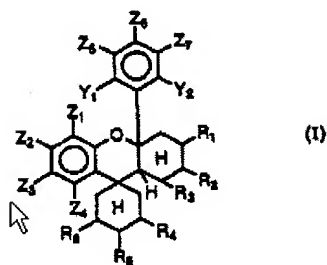
groups defined as R_2 . KAWATA et al disclose hydrogen groups at the R_2 location in his photosensitizer and a phenolic compound differing from the claimed phenol compound defined as (C2), (C3), or (C4). Evidence demonstrating that the prior art composition lacks the same properties as disclosed, when using the prior art photosensitizer and phenolic additive may be helpful in order to over the *prima facie* case of obviousness.

The rejection is repeated.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. UETANI et al '155 is cited to disclose that the phenol compound as defined in the current application as (C4), may be an incorrect formula, note the Certificate of Correction submitted by UETANI et al which corrects formula (I) from



to the correct formula shown below.



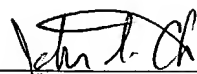
8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

The fax phone number for the USPTO is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1700.



John S. Chu
Primary Examiner, Group 1700

J.Chu
May 13, 2004